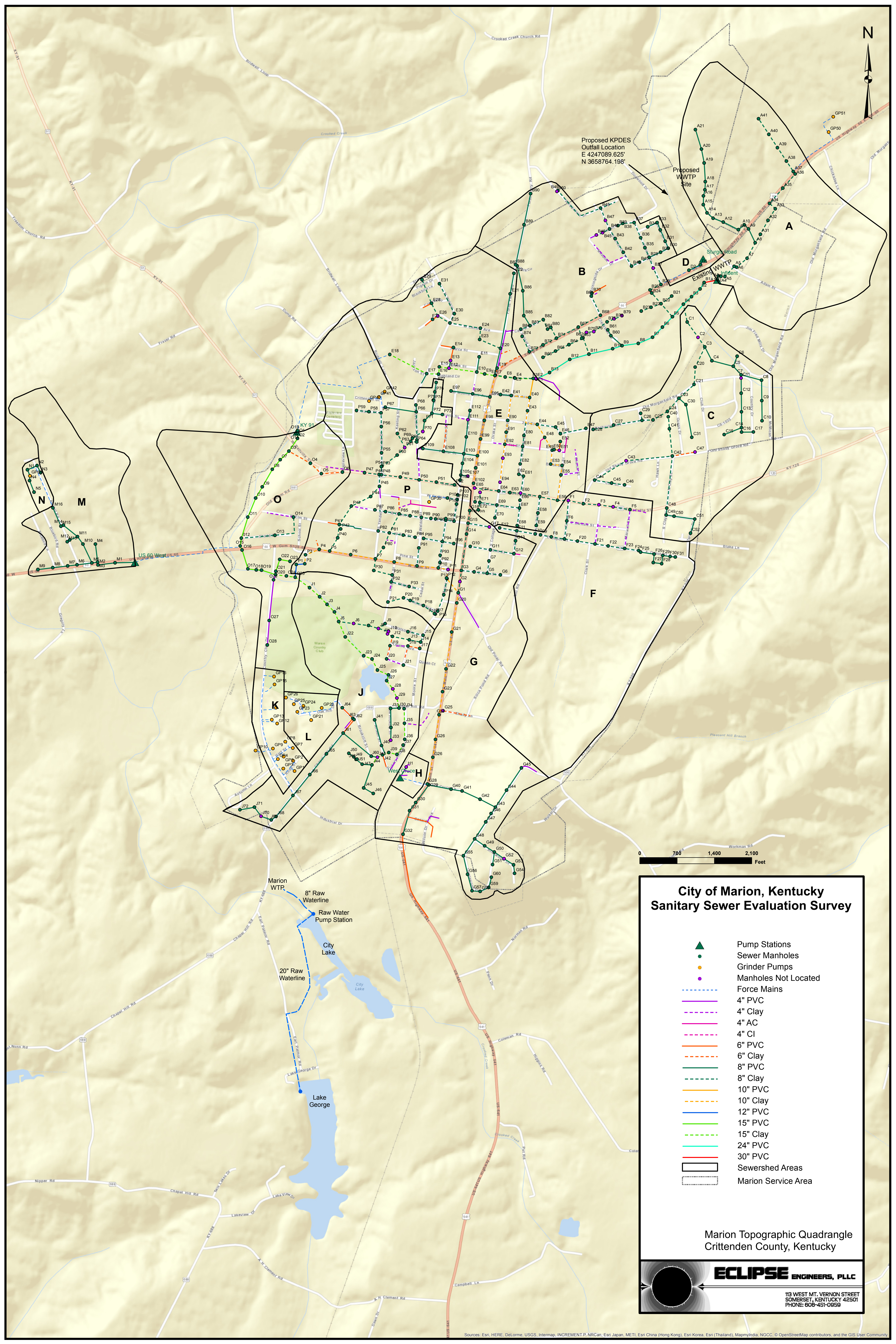


Appendix H

Marion Wastewater Collection System



**City of Marion, Kentucky
Sanitary Sewer Evaluation Survey**

- Pump Stations
- Sewer Manholes
- Grinder Pumps
- Manholes Not Located
- Force Mains
- 4" PVC
- 4" Clay
- 4" AC
- 4" CI
- 6" PVC
- 6" Clay
- 8" PVC
- 8" Clay
- 10" PVC
- 10" Clay
- 12" PVC
- 15" PVC
- 15" Clay
- 24" PVC
- 30" PVC
- Sewershed Areas
- Marion Service Area

Marion Topographic Quadrangle
Crittenden County, Kentucky

ECLIPSE ENGINEERS, PLLC

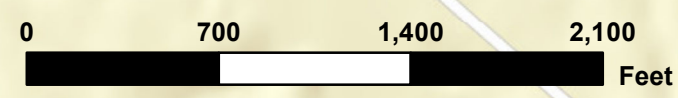
113 WEST MT. VERNON STREET
SOMERSET, KENTUCKY 42501
PHONE: 606-451-0959

Appendix I

Other KPDES Permits - None

Appendix J

Collection System Improvements



City of Marion, Kentucky Collection System Improvements

- Pump Stations
- Sewer Manholes
- Grinder Pumps
- Manholes Not Located
- Force Mains
- 4" PVC
- 4" Clay
- 4" AC
- 4" CI
- 6" PVC
- 6" Clay
- 8" PVC
- 8" Clay
- 10" PVC
- 10" Clay
- 12" PVC
- 15" PVC
- 15" Clay
- 24" PVC
- 30" PVC
- Sewershed Areas
- Marion Service Area
- Proposed Improvements

Marion Topographic Quadrangle
Crittenden County, Kentucky

ECLIPSE ENGINEERS, PLLC
113 WEST MT. VERNON STREET
SOMERSET, KENTUCKY 42501
PHONE: 606-451-0959

City of Marion
Collection System Improvements
Watershed B

<i>Item No.</i>	<i>Description</i>	<i>QTY</i>	<i>Unit</i>	<i>Unit Price</i>	<i>Total</i>
1	4-inch PVC SDR 35 Gravity Sewer - Open Cut	0	LF	\$20	\$0
2	8-inch PVC SDR 35 Gravity Sewer - Open Cut	0	LF	\$60	\$0
3	4-foot Diameter Manhole	5	EA	\$2,000	\$10,000
4	4-foot Diameter Manhole Repair	17	EA	\$1,000	\$17,000
5	CIPP Sewer Rehabilitation	5,700	LF	\$50	\$285,000
6	Connect to Existing Lateral - Open Cut	50	EA	\$300	\$15,000
7	4-inch Sanitary Sewer Cleanout/Lateral Assembly	0	EA	\$200	\$0
8	Connect to Existing Manhole	0	EA	\$1,000	\$0
Subtotal					\$327,000
<i>Construction Contingency 10%</i>					<i>\$32,700</i>
Total Opinion of Probable Construction Cost					\$359,700

City of Marion
Collection System Improvements
Watershed C

Item No.	Description	QTY	Unit	Unit Price	Total
1	4-inch PVC SDR 35 Gravity Sewer - Open Cut	0	LF	\$20	\$0
2	8-inch PVC SDR 35 Gravity Sewer - Open Cut	2,500	LF	\$60	\$150,000
3	4-foot Diameter Manhole	9	EA	\$2,000	\$18,000
4	4-foot Diameter Manhole Repair	3	EA	\$1,000	\$3,000
5	CIPP Sewer Rehabilitation	800	LF	\$50	\$40,000
6	Connect to Existing Lateral - Open Cut	13	EA	\$300	\$3,900
7	4-inch Sanitary Sewer Cleanout/Lateral Assembly	0	EA	\$200	\$0
8	Connect to Existing Manhole	0	EA	\$1,000	\$0
Subtotal					\$214,900
<i>Construction Contingency 10%</i>					<i>\$21,490</i>
Total Opinion of Probable Construction Cost					\$236,390

City of Marion
Collection System Improvements
Watershed E

Item No.	Description	QTY	Unit	Unit Price	Total
1	4-inch PVC SDR 35 Gravity Sewer - Open Cut	0	LF	\$20	\$0
2	8-inch PVC SDR 35 Gravity Sewer - Open Cut	1,500	LF	\$60	\$90,000
3	4-foot Diameter Manhole	11	EA	\$2,000	\$22,000
4	4-foot Diameter Manhole Repair	20	EA	\$1,000	\$20,000
5	CIPP Sewer Rehabilitation	5,300	LF	\$50	\$265,000
6	Connect to Existing Lateral - Open Cut	30	EA	\$300	\$9,000
7	4-inch Sanitary Sewer Cleanout/Lateral Assembly	0	EA	\$200	\$0
8	Connect to Existing Manhole	0	EA	\$1,000	\$0
Subtotal					\$406,000
<i>Construction Contingency 10%</i>					\$40,600
Total Opinion of Probable Construction Cost					\$446,600

City of Marion
Collection System Improvements
Watershed F

<i>Item No.</i>	<i>Description</i>	<i>QTY</i>	<i>Unit</i>	<i>Unit Price</i>	<i>Total</i>
1	4-inch PVC SDR 35 Gravity Sewer - Open Cut	1,000	LF	\$20	\$20,000
2	8-inch PVC SDR 35 Gravity Sewer - Open Cut	2,500	LF	\$60	\$150,000
3	4-foot Diameter Manhole	7	EA	\$2,000	\$14,000
4	4-foot Diameter Manhole Repair	0	EA	\$1,000	\$0
5	CIPP Sewer Rehabilitation	0	LF	\$50	\$0
6	Connect to Existing Lateral - Open Cut	15	EA	\$300	\$4,500
7	4-inch Sanitary Sewer Cleanout/Lateral Assembly	15	EA	\$200	\$3,000
8	Connect to Existing Manhole	1	EA	\$1,000	\$1,000
Subtotal					\$192,500
<i>Construction Contingency 10%</i>					\$19,250
Total Opinion of Probable Construction Cost					\$211,750

City of Marion
Collection System Improvements
Watershed G

<i>Item No.</i>	<i>Description</i>	<i>QTY</i>	<i>Unit</i>	<i>Unit Price</i>	<i>Total</i>
1	4-inch PVC SDR 35 Gravity Sewer - Open Cut	0	LF	\$20	\$0
2	8-inch PVC SDR 35 Gravity Sewer - Open Cut	0	LF	\$60	\$0
3	4-foot Diameter Manhole	0	EA	\$2,000	\$0
4	4-foot Diameter Manhole Repair	11	EA	\$1,000	\$11,000
5	CIPP Sewer Rehabilitation	3,600	LF	\$50	\$180,000
6	Connect to Existing Lateral - Open Cut	30	EA	\$300	\$9,000
7	4-inch Sanitary Sewer Cleanout/Lateral Assembly	0	EA	\$200	\$0
8	Connect to Existing Manhole	0	EA	\$1,000	\$0
Subtotal					\$200,000
<i>Construction Contingency 10%</i>					\$20,000
Total Opinion of Probable Construction Cost					\$220,000

City of Marion
Collection System Improvements
Watershed J

<i>Item No.</i>	<i>Description</i>	<i>QTY</i>	<i>Unit</i>	<i>Unit Price</i>	<i>Total</i>
1	4-inch PVC SDR 35 Gravity Sewer - Open Cut	0	LF	\$20	\$0
2	8-inch PVC SDR 35 Gravity Sewer - Open Cut	0	LF	\$60	\$0
3	4-foot Diameter Manhole	0	EA	\$2,000	\$0
4	4-foot Diameter Manhole Repair	39	EA	\$1,000	\$39,000
5	CIPP Sewer Rehabilitation	8,500	LF	\$50	\$425,000
6	Connect to Existing Lateral - Open Cut	30	EA	\$300	\$9,000
7	4-inch Sanitary Sewer Cleanout/Lateral Assembly	0	EA	\$200	\$0
8	Connect to Existing Manhole	0	EA	\$1,000	\$0
Subtotal					\$473,000
<i>Construction Contingency 10%</i>					\$47,300
Total Opinion of Probable Construction Cost					\$520,300

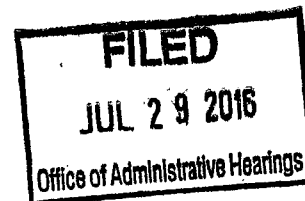
City of Marion
Collection System Improvements
Watershed P

Item No.	Description	QTY	Unit	Unit Price	Total
1	4-inch PVC SDR 35 Gravity Sewer - Open Cut	0	LF	\$20	\$0
2	8-inch PVC SDR 35 Gravity Sewer - Open Cut	0	LF	\$60	\$0
3	4-foot Diameter Manhole	0	EA	\$2,000	\$0
4	4-foot Diameter Manhole Repair	6	EA	\$1,000	\$6,000
5	CIPP Sewer Rehabilitation	1,350	LF	\$50	\$67,500
6	Connect to Existing Lateral - Open Cut	20	EA	\$300	\$6,000
7	4-inch Sanitary Sewer Cleanout/Lateral Assembly	0	EA	\$200	\$0
8	Connect to Existing Manhole	0	EA	\$1,000	\$0
Subtotal					\$79,500
<i>Construction Contingency 10%</i>					<i>\$7,950</i>
Total Opinion of Probable Construction Cost					\$87,450

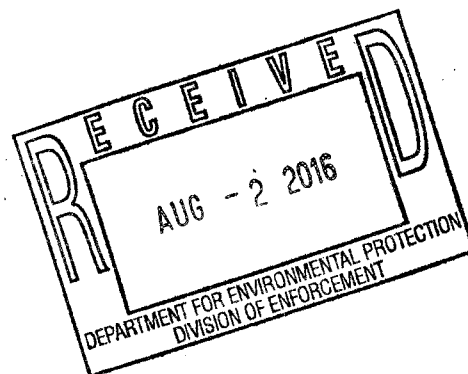
Appendix K

Agreed Order

COMMONWEALTH OF KENTUCKY
ENERGY AND ENVIRONMENT CABINET
DIVISION OF ENFORCEMENT
CASE NO. DOW-150141



IN RE: Marion WWTP
530 Adams St.
Marion, KY 42064
AI No. 867
Activity ID No. ERF20150001



AGREED ORDER

WHEREAS, the parties to this Agreed Order, the Energy and Environment Cabinet (hereinafter "Cabinet") and the City of Marion (hereinafter "Marion") state:

STATEMENTS OF FACT

1. The Cabinet is charged with the statutory duty of enforcing KRS Chapter 224 and the regulations promulgated pursuant thereto.
2. Marion owns and operates a municipal wastewater treatment plant (hereinafter "WWTP") located at 530 Adams St. Marion, KY 42064, Crittenden County, Kentucky.
3. Marion operates the WWTP under Kentucky Pollutant Discharge Elimination System (hereinafter "KPDES") permit KY0020061, which expires March 31, 2018.
4. On February 15, 2015, authorized representatives of the Cabinet identified the following violations of KRS Chapter 224 and the regulations promulgated pursuant thereto at the facility described in paragraph 2 above:
 - A. KRS 224.70-110—Discharging a pollutant to the waters of the Commonwealth. 98 bypasses of untreated sewage occurred during January 2010-January 2015.
 - B. KRS 224.70-110—Discharging a pollutant to the waters of the Commonwealth. Failing to mitigate conditions leading to a discharge of sludge in violations of KPDES Permit No. KY0020061.
 - C. 401 KAR 5:010 Section 1—Failing to have a Class II Certified WWTP operator.

5. On March 9, 2015, the Cabinet issued Marion a Notice of Violation for the violations described in paragraph 4 above.

6. Representatives of Marion attended an administrative conference with the Cabinet's Division of Enforcement (hereinafter "DENF") in Frankfort, Kentucky, on November 30, 2015, and admitted to the violations described in this Agreed Order.

NOW THEREFORE, in the interest of settling all civil claims and controversies involving the violations described above, the parties hereby consent to the entry of this Agreed Order and agree as follows:

REMEDIAL MEASURES

7. At all times, Marion shall report to the Cabinet all spills, bypass discharges, upset condition discharges or the releases of substances from its facility identified above which would result in or contribute to the pollution of the waters of the Commonwealth, including emergency and accidental releases, in accordance with KRS 224.1-400, 401 KAR 5:015, 401 KAR 5:065 and its permit. Marion shall make its initial report of the above discharges or releases to the DOW Madisonville Regional Office, 270-824-7529 during normal work hours and the Cabinet's 24-hour notification number, 800-928-2380 or 502-564-2380. This reporting requirement shall be in addition to any other reporting required by law.

8. At all times, Marion shall provide for proper and regular operation and maintenance to its sewage collection system and WWTP in accordance with 401 KAR 5:065 and its permit conditions.

9. Within thirty (30) days of execution of this Agreed Order, Marion shall submit to DENF for review and acceptance, a written plan for Corrective Actions (CAP) to bring the facility into compliance with its KPDES permit.

A. The CAP shall include, but not be limited to, an identification of actions Marion shall implement to ensure compliance with permit requirements including:

1. Proper operation and maintenance of its WWTP and collection system;
2. Identification and correction of Inflow/Infiltration (I/I) within Marion's collection systems, including but not limited to:
 - I. Identifying all significant sources of I/I into the collection system;
 - II. A compliance schedule and description of corrective actions to be undertaken for correcting all cost effective sources of I/I into those collection systems;
 - III. Including updated detailed maps, sketches and schematic diagrams of the current collection systems; and
 - IV. A copy the Sewer Use Ordinance and proof of enforcement.
3. The development and submittal of a complete and approvable Facility Plan. The Facility Plan should provide discussion of flows, particularly I/I, and how excess flows will be handled at the WWTP (i.e. equalization) to meet all regulations associated with discharges to streams. This new treatment system as described in the Facility Plan is to be designed, built, and operational within five (5) years of the execution of this Agreed Order. The by-pass line shall be eliminated upon completion of the new WWTP.
4. The CAP shall include a list of all actions necessary to ensure the completion of upgrades to its facility and collections system including a list of completion dates for each action, and a final compliance date for completion of all remedial measures included in the CAP.

B. Upon review of the CAP, the Cabinet may, in whole or in part, (1) accept or (2) provide comments to Marion identifying the deficiencies. Upon receipt of Cabinet comments, Marion shall have ninety (90) days to revise and resubmit the CAP for review and acceptance. Upon resubmittal, the Cabinet may, in whole or in part, (1) accept or (2) disapprove and provide comments to Marion identifying the deficiencies. Upon such resubmittal, if the CAP is disapproved, the Cabinet may deem Marion to be out of compliance with this Agreed Order for failure to timely submit the CAP.

C. Marion may request an amendment of the accepted CAP by writing the Director of the Division of Enforcement at 300 Fair Oaks Lane, Frankfort, Kentucky 40601 and stating the reasons for the request. If granted, the amended CAP shall not affect any provision of this Agreed Order unless expressly provided in the amended CAP. This does not require an amendment request pursuant to paragraph twenty four (24) of this Agreed Order.

10. At the end of the first calendar quarter following the execution of this Agreed Order, Marion shall submit quarterly progress reports for each three month period no later than the thirtieth (30th) day of the month following the end of the quarter to the Cabinet that describes its progress in complying with this Agreed Order. The quarterly report shall include, at a minimum:

- I. A detailed description of projects and activities conducted and completed during the past reporting period to comply with the requirements of this Agreed Order;
- II. The anticipated projects and activities that will be performed in the upcoming three month period to comply with the requirements of this Agreed Order; and

III. Any additional information necessary to demonstrate that Marion is adequately implementing its CAP.

11. Immediately cease all discharges that are aesthetically or otherwise degrading the waters of the Commonwealth.

12. Immediately cease all activity, which is contributing or has contributed to the pollution of the waters of the Commonwealth.

13. By the date specified in the CAP, Marion shall be in compliance with KRS 224, and the regulations promulgated pursuant thereto, KPDES Permit No. KY0020061, and this Agreed Order.

14. All submittals required by the terms of the Agreed Order shall be submitted to:

Division of Enforcement
Attention: Director
300 Fair Oaks Lane
Frankfort, KY 40601

PENALTIES

15. Marion shall pay a civil penalty in the amount of ten thousand dollars (\$10,000) for the violations described above. The penalty shall be tendered by Marion to the Cabinet within thirty (30) days of execution of this Agreed Order.

16. Payment of penalties shall be by cashier's check, certified check, or money order, made payable to "Kentucky State Treasurer" and shall be sent to the attention of: Director, Division of Enforcement, 300 Fair Oaks Lane, Frankfort, Kentucky 40601. Please note "Case No. DOW-150141" on the instrument of payment.

STIPULATED PENALTIES

17. Following the execution of this Agreed Order and until its termination, stipulated penalties for failure to comply with paragraph nine (9) herein may be assessed as follows:

DOW-150141

- A. For each failure to timely submit the CAP in accordance with paragraph nine (9) a stipulated penalty in the amount of two thousand five hundred (\$2,500) dollars per instance may be assessed.
- B. For each failure to timely complete each action identified in the accepted CAP a stipulated penalty in the amount of one thousand (\$1,000) dollars per instance may be assessed.

18. Stipulated penalties are in addition to and not in lieu of any other penalty which could be assessed by the Cabinet. The Cabinet may, in its discretion, waive stipulated penalties that would otherwise be due. The stipulated penalty shall be due and owing within thirty (30) days after Marion's receipt of written notification by the Cabinet to Marion at the permitted address.

19. If Marion believes the request for payment of a stipulated penalty is erroneous or contrary to law, Marion may request a hearing in accordance with KRS 224.10-420(2). A request for hearing does not excuse timely payment of the penalty. If an order is entered pursuant to KRS 224.10-440 that excuses payment, the Cabinet will refund the payment. Failure to make timely payment shall constitute an additional violation.

20. Payment of the stipulated penalties shall be by cashier's check, certified check, or money order, made payable to "Kentucky State Treasurer" and shall be sent to the attention of: Director, Division of Enforcement, 300 Fair Oaks Lane, Frankfort, Kentucky 40601. Please note "Case No. DOW-150141" on the instrument of payment.

MISCELLANEOUS PROVISIONS

21. This Agreed Order addresses only the violations specifically admitted above. Other than those matters resolved by entry of this Agreed Order, nothing contained herein shall be construed to waive or to limit any remedy or cause of action by the Cabinet based on statutes

or regulations under its jurisdiction and Marion reserves its defenses thereto. The Cabinet expressly reserves its right at any time to issue administrative orders and to take any other action it deems necessary that is not inconsistent with this Agreed Order, including the right to order all necessary remedial measures, assess penalties for violations, or recover all response costs incurred, and Marion reserves its defenses thereto.

22. This Agreed Order shall not prevent the Cabinet from issuing, reissuing, renewing, modifying, revoking, suspending, denying, terminating, or reopening any permit to Marion. Marion reserves its defenses thereto, except that Marion shall not use this Agreed Order as a defense to those permitting actions.

23. Marion waives its right to any hearing on the matters admitted herein. However, failure by Marion to comply strictly with any or all of the terms of this Agreed Order shall be grounds for the Cabinet to seek enforcement of this Agreed Order in Franklin Circuit Court and to pursue any other appropriate administrative or judicial action under KRS Chapter 224 and the regulations promulgated pursuant thereto.

24. The Agreed Order may not be amended except by a written order of the Cabinet's Secretary or his designee. Marion may request an amendment by writing the Director of the Division of Enforcement at 300 Fair Oaks Lane, Frankfort, Kentucky 40601, and stating the reasons for the request. If granted, the amended Agreed Order shall not affect any provision of this Agreed Order unless expressly provided in the amended Agreed Order.

25. The Cabinet does not, by its consent to the entry of this Agreed Order, warrant or aver in any manner that Marion's complete compliance with this Agreed Order will result in compliance with the provisions of KRS Chapter 224 and the regulations promulgated pursuant thereto. Notwithstanding the Cabinet's review and approval of any plans formulated pursuant to this Agreed Order, Marion shall remain solely responsible for compliance with the terms of KRS

Chapter 224 and the regulations promulgated thereto, this Agreed Order, and any permit and compliance schedule requirements.

26. Marion shall give notice of this Agreed Order to any purchaser, lessee or successor in interest prior to the transfer of ownership and/or operation of any part of the facility occurring prior to termination of this Agreed Order, shall notify the Cabinet that such notice has been given, and shall follow all statutory requirements for a transfer. Whether or not a transfer takes place, Marion shall remain fully responsible for payment of all civil penalties and for performance of all remedial measures identified in this Agreed Order.

27. The Cabinet agrees to allow the performance of the above listed remedial measures and payment of civil penalties by Marion to satisfy Marion's obligations to the Cabinet generated by the violations admitted above.

28. The Cabinet and Marion agree that the remedial measures agreed to herein are facility-specific and designed to comply with the statutes and regulations cited herein. This Agreed Order applies specifically and exclusively to the unique facility referenced herein and is inapplicable to any other site or facility.

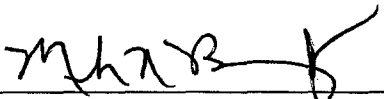
29. Compliance with this Agreed Order is not conditioned upon the receipt of any federal, state, or local funds.

30. This Agreed Order shall be of no force and effect unless and until it is entered by the Secretary or his designee as evidenced by his signature thereon. If this Agreed Order contains any date by which Marion is to take any action or cease any activity, and the Secretary enters the Agreed Order after that date, then Marion is nonetheless obligated to have taken the action or ceased the activity by the date contained in this Agreed Order.

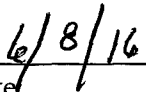
TERMINATION

31. This Agreed Order shall terminate upon Marion's completion of all requirements described in this Agreed Order. Marion may submit written notice to the Cabinet when it believes all requirements have been performed. The Cabinet will notify Marion in writing of whether it intends to agree with or object to termination. The Cabinet reserves its right to enforce the Agreed Order, and Marion reserves its right to file a petition for hearing pursuant to KRS 224.10-420(2) contesting the Cabinet's determination.

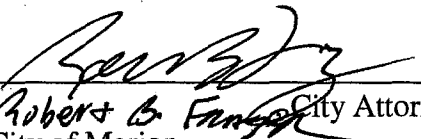
AGREED TO BY:



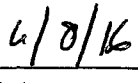
Mark R. Bryant, City Administrator
City of Marion



Date

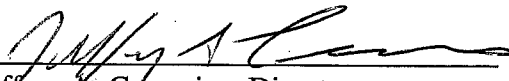


Robert B. Fanger, City Attorney
City of Marion




Date


APPROVAL RECOMMENDED BY:


Jeffrey A. Cummins, Director
Division of Enforcement

7/15/2016
Date


John G. Horne II, General Counsel
Energy and Environment Cabinet

7/20/2016
Date

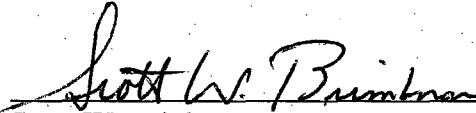

R. Bruce Scott, Deputy Secretary
Energy and Environment Cabinet

7/20/2016
Date

ORDER

Therefore, the foregoing Agreed Order is entered as the final Order of the Energy and Environment Cabinet this 24^{*} day of July, 2016.

ENERGY AND ENVIRONMENT CABINET

A handwritten signature in cursive script, reading "Scott W. Brinkman", is written over a horizontal line.

Scott W. Brinkman,
Secretary of the Governor's Executive Cabinet

CERTIFICATE OF SERVICE

I hereby certify that a true and accurate copy of the foregoing **AGREED ORDER** was mailed, postage prepaid, to the following this 29th day of July, 2016.

Mark R. Bryant
City Administrator
City of Marion, KY
217 South Main St.
Marion, KY 42064

and mailed, messenger to:

Jeffrey A. Cummins, Director
Division of Enforcement
300 Fair Oaks Ln.
Frankfort, KY 40601

John G. Horne II, General Counsel
Energy and Environment Cabinet
500 Capital Plaza Tower
12th Floor
Frankfort, KY 40601

Kathy McDonald
DOCKET COORDINATOR

FBT

SH

Scanning Batch Sheet

Prepped by:	Philip Kejzlar	Return to:	Philip Kejzlar
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Duplex		CD		Recycle	
8.5 x 11		Other			

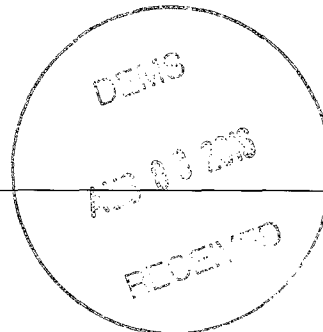
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Document Title:	Executed Agreed Order

Batch Name: 65

Air Quality		Comp. & Tech Asst.	Permit Support – Surface Water	
Enforcement	X	Compliance Lab Cert.	SRF & SPSP	
Hazardous Waste		Construction & Compliance	Surface Water	
Recycling & Local Asst.		Dam Safety & Floodplain	Waste Water Mun. Planning	
Solid Waste		Engineering –Surface Water	Water Infrastructure	
Superfund		Floodplain Mgmt.	Water Quality	
Underground Storage Tank		Ground Water	Watershed Mgmt.	
Capacity Development		Operational Permits	Wet Weather	

Program Misc. Information:

Marion WWTP



Appendix L
Corrective Action Plan



MATTHEW G. BEVIN
GOVERNOR

CHARLES G. SNAVELY
SECRETARY

ENERGY AND ENVIRONMENT CABINET

DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF ENFORCEMENT
300 SOWER BOULEVARD
FRANKFORT KENTUCKY 40601
www.kentuckv.gov

January 27, 2017

City of Marion
Attn: Michael D. Alexander, Mayor
217 S. Main St.
Marion, KY 42064

Re: AI Name: Marion WWTP
AI No. 867
Case No. DOW-150141
Activity No. ERF20150001
Facility ID: KY0020061
Crittenden County

Dear Mayor Alexander:

The Cabinet has reviewed and accepted the Corrective Action Plan submitted on October 20, 2016. Please ensure that it is timely implemented and the Cabinet notified of project completions.

If you have any questions, please contact me at (502) 7862-6862 or philip.kejzlar@ky.gov.

Sincerely,

Philip Kejzlar,
Environmental Enforcement Specialist
Division of Enforcement

CC:
Alan R. Robinson, PE
Eclipse Engineers, PLLC
113 West Mt. Vernon Street
Somerset, KY 42501



CITY OF MARION, KY
CORRECTIVE ACTION PLAN
OCTOBER 20, 2016

Prepared by:



October 20, 2016

Philip Kejzlar
Environmental Enforcement Specialist
Kentucky Division of Enforcement
300 Fair Oaks Lane
Frankfort, Kentucky 40601

Re: Corrective Action Plan (CAP)
Marion Wastewater Treatment Plant and Collection System Improvements
Case No. DOW-150141
AI No. 867
Activity ID No. ERF20150001
Marion Wastewater Treatment Plant – KY0020061
City of Marion, Kentucky

Dear Mr. Kejzlar:

Per the Agreed Order (AO) referenced above and received by the City of Marion (City) on July 25, 2016 and with many past meetings between the City, Division of Enforcement (DOE), and our engineer; we are replying as required with this Corrective Action Plan (CAP) detailed herein. Also, attached you will find a corresponding schedule as it relates to the work forthcoming as described.

The AO ultimately will require the City to construct a new wastewater treatment plant (WWTP). With that, DOE is also requiring the City to complete the preliminary steps leading towards this construction.

These steps include the following:

Development of a new Facilities Plan

Development of a Sanitary Sewer Evaluation Study Update

- Sanitary Sewer Evaluation Survey - The City will proceed with a Sanitary Sewer Evaluation Survey (SSES) Update from our May 2002 SSES which included a complete system-wide survey. The SSES Update will confirm significant I/I sources and allow us to plan and develop a major collection system capital improvements project which will include a combination of dig and replace work as well as cast-in-place and/or fold and form lining technologies. The KY91 Pump Station will be rehabilitated with this project as well to reduce future SSO's. The SSES Update will be completed by March 2017.
- Facilities Plan - The City will proceed with a new Facilities Plan (FP) now that our sanitary sewer mapping project is complete. The FP will discuss current and projected flow rates, particularly I/I, and how excess flow will be handled at the new WWTP to meet regulations. The treatment system described and selected in the FP will be designed, constructed, and operational by July 25, 2021. The Facilities Plan will be completed by April 2017.

- The City was approved by the KIA Board for Planning and Design funds on June 2, 2016 from our 2015 Clean Water KIA SRF application. These funds are designated to the development of the tasks listed above as well as the planning and design of both the new WWTP and collection system improvements.
- The City and Eclipse Engineers will continue to perform smoke testing, manhole inspections, and point repairs to reduce I&I in the collection system during planning and design and will focus on areas of the system that need the most attention as they become available from our Engineer.
- Other steps developing from the FP and SSES or in conjunction with the entire project the City will proceed with include:
 - Complete Planning and Preliminary Design of both the WWTP and Collection System Improvements – Completed by April 2017
 - Phase 1 Archaeological Study for the WWTP – Completed by May 2017
 - Environmental Review/Approval including Fish and Wildlife and ACOE Review – Completed by October 2017
 - Sanitary Sewer and Water System Rate Study – Completed by August 2017
 - Initial Geotechnical Site Study for the WWTP – Completed by September 2017
 - Collection System Improvements Final Design – Completed by December 2017
 - WWTP Final Design – Completed by May 2018
 - Collection System Improvements Construction – Completed by October 2019
 - WWTP Construction – Completed by February 2021
 - Final Completion Date for all Remedial Measures shall be July 25, 2021

Supporting work for these tasks include WWTP Value Engineering Sessions before advertising for bids and O&M Manual, Plan of Operation, Start-up/Training, and Performance Evaluation after construction is complete. This project will be funded by a KIA Fund A loan with some principle forgiveness. The City will apply for a CDBG Grant as well.

The City or its engineer will submit quarterly reports describing the progress towards compliance with the AO. These reports will include descriptions of completed and upcoming activities.

The City Council must accept these procedures and deadlines as listed in this letter. Therefore, we reserve the right to rescind the statements above should the Council object on or after the date of this letter. In the event the Council has no objections, this letter will stand as the City's intent.

If you need any additional information or have any comments do not hesitate to call Alan Robinson with Eclipse Engineers at (606) 451-0959 or (859) 433-9585.

Sincerely,

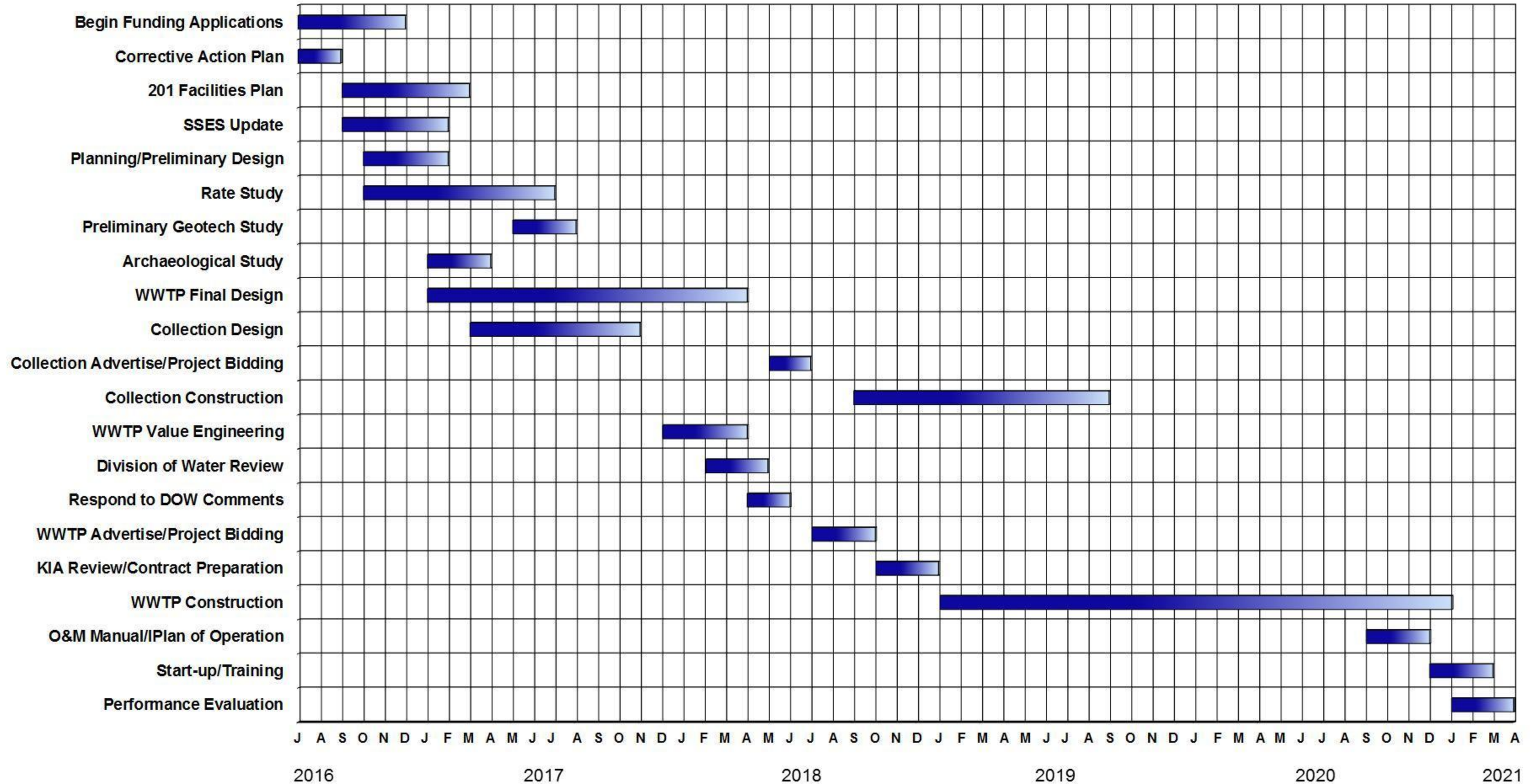
Michael D. Alexander
Mayor

cc: Alan Robinson, P.E., Eclipse Engineers

Marion Wastewater Treatment Plant and Collection System Improvements

City of Marion

July 2016





www.eclipseengineers.net

Appendix M

Wasteload Allocation Letter



MATTHEW G. BEVIN
GOVERNOR

CHARLES G. SNAVELY
SECRETARY

**ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION**

AARON B. KEATLEY
COMMISSIONER

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601

September 28, 2017

Alan R. Robinson, P.E.
President
Eclipse Engineers, PLLC
113 West Mt. Vernon Street
Somerset, Kentucky 42501

Re: Waste Load Allocation Update Request
New Marion Wastewater Treatment Plant
KPDES No.: KY0020061
Crittenden County, Kentucky

Dear Mr. Robinson:

This is in response to your July 26, 2017 email, requesting an update to preliminary limits provided in Division of Water (DOW) correspondence dated March 20, 2017. Per your email, based on facility planning considerations, the proposed design capacity has been increased from 0.9 million gallons per day (MGD) to 1.5 MGD. The proposed WWTP will replace the existing 0.66 MGD treatment facility. Discharge is to be relocated approximately 0.35 miles downstream near National Hydrography Dataset (NHD) river mile (RM) 1.0 of Rush Creek at 88°04'10" west longitude and 37°20'55" north latitude. The requested WLA information will be utilized in drafting a Regional Wastewater Facilities Plan update.

The division notes that Rush Creek (NHD RM 0.0 to 1.3) is included on the 2014 303(d) List of impaired waters. The impaired use is warm water aquatic habitat (partial support). Pollutants of concern are: nutrient/eutrophication biological factors, organic enrichment (sewage) biological indicators and specific conductance. Suspected sources are: municipal point source discharges. State and Federal regulations allow new or expanded discharges into impaired waters only if the discharge will improve, or at least not contribute, to existing impairments. Discharge from a new WWTP, in compliance with applicable Kentucky Pollutant Discharge Elimination System (KPDES) permit limitations and requirements, including the addition of a limit on total phosphorus, will help facilitate an improvement in water quality, and can thus be approved.

Considering the above-mentioned information, applicable effluent limitations are provided below.

Mr. Alan Robinson
Waste Load Allocation Update Request
Page Two

Design Capacity = 1.5 MGD / Discharge near NHD RM 1.0 of Rush Creek

<u>Parameter</u>	<u>May 1 - October 31</u>	<u>November 1 - April 30</u>
CBOD ₅	15 mg/l	15 mg/l
Total Suspended Solids	30 mg/l	30 mg/l
Ammonia Nitrogen	4 mg/l	8 mg/l
Dissolved Oxygen	7 mg/l	7 mg/l
Total Phosphorus	1 mg/l	1 mg/l
Total Nitrogen	Monitor, mg/l	Monitor, mg/l
Total Residual Chlorine	0.011 mg/l	0.011 mg/l

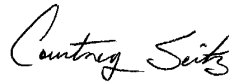
Reliability Classification = Grade C

In addition to the above requirements, the monthly average and weekly maximum values of E. coli shall be at or below 130 colonies per 100 milliliters or 240 colonies per 100 milliliters, respectively, the year around. If a form of chlorine is proposed to disinfect the wastewater, then de-chlorination will likely be needed to achieve the chlorine residual effluent concentration. Additional effluent limitations and water quality standards are contained in 401 KAR Chapter 5 and 401 KAR Chapter 10.

These preliminary design effluent limitations are valid for one (1) year from the date of this letter, and are subject to change as a result of additional information which may be presented during the public notice phase of the KPDES permitting process. As such, this letter does not convey any authorization or approval to proceed with the construction or operation of the proposed WWTP. Construction and KPDES permit applications must be submitted to request such authorization or approval. Nor does this letter ensure issuance of either permit. During the review processes of these permits the Division of Water will further evaluate the viability of the project.

Should you have any questions regarding this letter, please contact me at (502) 782-7066 or E-mail at Courtney.Seitz@ky.gov.

Sincerely,



Courtney Seitz, WLA Coordinator
Wet Weather Section
Surface Water Permits Branch
Division of Water

CS

c: Russell Neal, Water Infrastructure Branch
Compliance and Technical Assistance
Branch, Madisonville Section
TEMPO

Appendix N

Reliability and Redundancy Requirements Form

PUBLICLY OWNED TREATMENT WORKS (WWTP) RELIABILITY AND REDUNDANCY REQUIREMENTS

Clarification of 401 KAR 5:005 Section 13 paragraph (8a)

Influent Pumping:

Has an adequate number of pumps been provided to pump design peak hourly flow with the largest pump out of service?

☒ Yes ☐ No

Screening:

Where a single mechanically cleaned screen is used, has an auxiliary manually cleaned screen been provided? The screens shall each be designed to handle the design peak instantaneous flow.

☐ Yes ☐ No N/A

Where two or more mechanically cleaned screens are used, can the design peak instantaneous flow be handled with the largest unit out of service? Two mechanical screens shall be provided for plants with average daily design flows of 1.0 MGD and larger.

☒ Yes ☐ No

Where a comminutor is used, is the comminutor designed to handle the peak hourly flow and has a bypass channel with a manually cleaned bar screen been provided?

☐ Yes ☐ No N/A

Grit Removal:

For a WWTP treating waste from combined sewers, have at least two mechanically cleaned grit removal units, with provisions for bypassing, been provided? Each unit shall be designed to handle the design peak hourly flow.

☐ Yes ☐ No N/A

For a WWTP treating waste from separate sewers, have at least two mechanically cleaned grit removal units, with provisions for bypassing, been provided? Each unit shall be designed to handle at least one half of the design peak hourly flow.

☐ Yes ☐ No N/A

Settling Tanks:

Has an adequate number of clarifiers been provided to handle the design peak hourly flow and/or the peak solids loading rate with the largest unit out of service? This applies to primary, intermediate, and final clarifiers.

☒ Yes ☐ No

Biological Processes:

Activated Sludge Processes

Have at least two half size aeration tanks, with provisions for bypassing, been provided? The total tank volume shall be based on the design daily average organic load.

☒ Yes ☐ No

Has aeration equipment been provided, for each tank, to allow full design aeration demand to the aeration tanks with the largest aeration tank out of service?

☒ Yes ☐ No

Packed Towers

Have at least two half size towers, with provisions for bypassing, been provided?

☐ Yes ☐ No N/A

PUBLICLY OWNED TREATMENT WORKS (WWTP) RELIABILITY AND REDUNDANCY REQUIREMENTS

Tertiary Filters

Has an adequate number of units been provided to treat the design peak hourly flow with the largest unit out of service.?

☐ Yes ☐ No ☐ N/A

Post Aeration

For mechanical facilities, have backup aerators, blowers, etc. been provided?

☐ Yes ☐ No ☐ N/A

Disinfection

Has an adequate number of chlorinators, dechlorinators, and/or ultra-violet lamps been provided to allow for peak disinfection demand with the largest unit or bank of lamps out of service?

☒ Yes ☐ No

Has the chlorine contact tank been designed such that solids can be removed without taking the basin out of service? If not, then duplicate tanks, each with a detention time based on the design peak hourly flow, shall be provided.

☐ Yes ☐ No ☐ N/A

Digestion/Sludge Holding:

Have at least two half size tanks, with provisions for bypassing, been provided? The aeration equipment in each tank shall provide full backup at design loadings.

☐ Yes ☐ No ☐ N/A

Sludge Press:

If a single sludge press is proposed, is an alternate method of dewatering or wet sludge storage and/or disposal provided?

☐ Yes ☐ No ☐ N/A

Note 1: A demonstration, including calculations, shall be provided to verify the following:

- With the largest unit of any process out of service, the hydraulic capacity of the remaining units and their interconnecting piping is capable of handling the design peak instantaneous flow.
- The system has the flexibility to allow wastewater flows to bypass down units but still be distributed to the remaining in-service units.
- The wastewater flow and the return sludge can be proportionally split among the remaining in-service units.
- The permit limits, at design capacities, can be met with the largest unit of any process out of service during times of anticipated cleaning and maintenance.

Note 2: Alternate power requirements shall meet the criteria be as discussed under 401 KAR 5:005 Section 13 Paragraphs (1a), (1b), and (1c).

Note 3: All treatment processes shall be operational during the 25-year flood event and protected from damage during the 100-year flood event.

W/FCB/MDT-10/29/03

Appendix O

Preliminary Site Plan of Proposed WWTP

Appendix P

Written Comments

Appendix Q

Kentucky State Clearinghouse Comments

Appendix R

***Division of Water
Facilities Plan Preparation Checklist***

Regional Facility Plan Guidance

401 KAR 5:006

Kentucky Division of Water's Guidance for preparing a regional facility plan, as required by 401 KAR 5:006

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General Guidance

Regional facility planning is the process whereby current and future wastewater needs are evaluated, wastewater alternatives are developed to meet the needs, and a final plan is recommended through careful comparison and evaluation of the alternatives. The Cabinet reviews each regional facility plan to ensure that the recommended plan will comply with regulations. Elected officials, planning organizations, county health departments, and planning area residents should be included in regional facility planning as early as possible and, to the extent possible, should be apprised of the regional facility plan development.

Pre-planning Meeting Requirement

A regional planning agency must schedule a pre-planning meeting with the Cabinet to discuss the scope of the work before submitting the regional facility plan. The purpose of a pre-planning meeting is to provide the opportunity for Cabinet representatives and the regional planning agency to discuss an appropriate planning effort according to the purpose and need for the plan, elements of the plan, alternatives, scope and timing of projects, funding, applicable regulatory requirements, critical issues considered in reviewing the plan, and any constraints that may have a bearing on the decisions of the Cabinet.

Guidance Purpose and Use

This guidance is intended to provide recommendations to regional planning agencies to help meet the requirements of 401 KAR 5:006. To facilitate effective and timely review of the regional facility plan, read 401 KAR 5:006, follow this guidance document, and use the completeness checklist found in Section 12. This guidance is organized so that users can identify the requirements of each section and then access the specific recommendations regarding content for each section.

Submittal Requirements

Two (2) hard copies, one (1) shall be certified by a professional engineer licensed in Kentucky and one (1) non-certified digital copy of the regional facility plan and the planning area shapefile shall be submitted to the Cabinet. For consistent and expedient reviews, the Cabinet requests organizing the different sections of the facility plan in the order shown in the table of contents of this guidance document. Identify the different sources you used to prepare the facility plan. These may include but are not limited to books, research journals, websites and individuals who were consulted.

Section 1: Regional Facility Plan Summary

Requirements: This section shall provide a brief summary of the information provided in the regional facility plan, including the following:

1. Purpose of the plan and major problems evaluated in the plan.
2. Identify the recommended alternative chosen to remediate or correct the problems and/or serve the area of need identified in the plan. Also, include any institutional arrangements necessary to implement the recommended alternative.
3. Present the estimated cost of implementing the proposed plan (including user fees) and the proposed funding method.
4. Identify the planning agency commitments necessary to implement the plan like inter-municipal agreements, establishment of sanitation districts, or the need for any specific rules or ordinances.
5. Provide a schedule of implementation for projects that identify the major milestones with dates or timeframes necessary to accomplish the projects. Include dates for the future initiation of projects for planning periods in excess of five (5) years.

Section 2: Statement of Purpose and Need

Requirements: This section shall contain a brief description of the purpose and need of the regional facility plan. A regional facility plan will be triggered by 1 or 2 below.

1. The regional facility plan is required pursuant to 401 KAR 5:006 Section 2:
 - a. A new regional planning agency is formed;
 - b. A new wastewater treatment plant is proposed for construction within an existing planning area;
 - c. An existing regional planning agency proposes to expand the average daily design capacity of an existing wastewater treatment facility by more than thirty (30) percent;
 - d. The equivalent population served by an existing wastewater collection system or a system with a Kentucky Inter-System Operating Permit is proposed for expansion by more than thirty (30) percent of the population served in the previously approved regional facility plan.
2. The regional facility plan is necessary to address water quality or public health concerns, inadequate system or system components related to wastewater, or to comply with increased treatment levels that improve effluent quality.

Recommendations: If the regional facility plan is submitted to address inadequate system or system components related to wastewater that may impact water quality or public health concerns, the analysis should describe specific system needs and the severity and nature of the problems. These may include, but are not limited to problems caused by straight pipes, failing on-site systems that may be attributed to age, soil and geologic conditions, or topographic conditions, and problems within the existing wastewater collection and treatment system as discussed in Section 6 of this guidance document.

Section 3: Physical Characteristics of the Planning Area

Requirements: This section shall delineate the planning area boundaries and describe key topographic, geographic, and natural or man-made features of the area. Digital or electronic submission of the planning area boundary shapefile in a standard GIS format shall also be included. This section shall include the following maps:

1. One (1) current map, suitable for photocopying, indicating the planning area boundary, service area boundary, watershed boundaries, county lines, populated places, cities and/or towns, and project areas or proposed planning period phases.
2. One (1) current map, suitable for photocopying, including locations of wastewater treatment facilities (including package treatment plants), collection lines (gravity, force main, interceptors), pump stations, public drinking water intake points, and groundwater supply areas [Source Water Area Protection Plans (SWAPP) and/or Wellhead Protection Areas (WHPA)].
3. One (1) seven and one-half (7 ½) minute USGS topographic map.
4. One (1) current map delineating the 100-year floodplain.
5. A local planning and zoning land use map, if available.

Recommendations: In a planning area assessment, appropriate attention should be given to include the entire area where cost savings, regionalization, other management advantages, or environmental gains may result from interconnection of individual wastewater facilities or collective management of the systems. The regional facility plan should be carefully coordinated with applicable state, local, and regional land-use management regulations and plans. Projected land-use patterns and densities should be used as a basis for determining the optimum capacity, type, and location of facilities. Where land use plans have not been prepared for all or part of the planning area, an estimate of future land use patterns and densities should be prepared in consultation with existing planning agencies, zoning commissions, and elected officials. The input of elected officials is critical to the determination of future land use and development and will play a central role in defining the need for wastewater facilities.

Section 4: Socioeconomic Characteristics of the Planning Area

Requirements: The following characteristics of the planning area shall be discussed:

1. Historical, current, and projected population in the planning area.
2. Current and projected population in the existing service area and unsewered sections of the planning area (If proposed or appropriate, those sections of the planning area not currently sewered should be divided into time frames for service). Population projections shall be based on the 10 to 20 year proposed planning period and the basis for the projected population change shall be identified.
3. Current and projected industrial and commercial users of the system.
4. Economic or social impact on the affected community- discuss any positive or negative impact on the economy of the affected community including direct and/or indirect benefits that could occur as a result of the plan.

Recommendations: The projections of economic and population growth discussed in this section should be used for estimating future waste loads and flows. Projections should be based on an analysis of historical and current growth trends and an estimate of future residential, commercial, and industrial growth. The Kentucky State Data Center, regional planning agencies, federal and state census authorities should be used as sources of demographic information for communities within the planning area. If your projections are not consistent with those sources, you need to provide appropriate justification.

Section 5: Existing Environment in the Planning Area

Requirements: Describe existing physical, biological, cultural, and other resource features within the planning area with an emphasis on those that may be impacted by the proposed plan or projects, including the following:

1. **Physical:** Describe resource features such as surface water and groundwater quality, water sources and supply, wetlands, lakes, streams, air pollution, floodplains, soils, geology, and topography. Indicate whether waterbodies within the planning area are on the 303(d) or 305(b) list of waters reports in the Integrated Reports to Congress on Water Quality in Kentucky (<http://water.ky.gov/waterquality/Pages/IntegratedReport.aspx>). For 303(d) listed waterbodies, indicate the name, river mile segment(s) and/or impoundment acreage, the type of impairment(s) and the cause(s) and source(s) likely causing or contributing to the impairment(s). Also indicate whether a Total Maximum Daily Load (TMDL) has been approved or is under development that will allow the stream to meet water quality standards.
2. **Biological:** Identify plant and animal communities in the planning area with an emphasis upon those species likely to be impacted. Threatened or endangered status should be discussed if applicable.
3. **Cultural:** Describe archaeological and historical resources that may be affected by the proposed project.
4. **Other Resource Features:** Identify national and state parks, recreational areas, USDA Designated Important Farmland (includes prime farmland, unique farmland and farmland designated by the state or local jurisdiction), and any other applicable environmentally sensitive areas including drinking water supplies, shellfish beds, and outstanding natural resource waters.

Recommendations: The following websites are resources for environmental information:

Ground-Water Resources in Kentucky: <http://www.uky.edu/KGS/water/library/webintro.htm>

Kentucky Geography Network: <http://kygeonet.ky.gov/>

Integrated Report: <http://water.ky.gov/waterquality/Pages/IntegratedReport.aspx>

Kentucky Department of Fish and Wildlife Species Information:

<http://fw.ky.gov/kfwis/speciesInfo/speciesInfo.asp>

Kentucky Infrastructure Authority- Water Resources Information System:

<http://kia.ky.gov/wris/ims.htm>; <http://kia.ky.gov/wris/data.htm>

The Commonwealth Map: <http://kygisserver.ky.gov/tcmbase/>

Web Soil Survey: <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

Section 6: Existing Wastewater System

***This section shall be prepared by a professional engineer licensed in Kentucky.**

Requirements: A description of the existing facilities serving the planning area shall include the following:

1. **On-site Disposal:** Describe septic tank problems or straight pipe discharges in the planning area, including an approximate number of households using septic tanks or straight pipes. This data is generally attainable from local health departments that issue on-site subsurface disposal permits. List the areas that utilize on-site disposal for treatment of wastewater by general location on a map.
2. **Treatment Plant(s):** Describe the type, age, design capacity, process units, peak and average wastewater flows, present effluent limits, including schematic layout of treatment plant. Provide a narrative description of the capacity of the treatment plant to meet reliability and redundancy requirements in 401 KAR 5:005, Section 13.
3. **Collection and Conveyance System:** Describe the size, material type, age, and condition of sewer collection lines, force mains, and interceptors. Describe the type, horsepower, pumping capacity, dynamic head, age, and condition of pump stations.
4. **Biosolids Disposal:** Describe the method of residuals disposal, including management of septage, biosolids/sludge, scum, grit, and screenings. Volumes of wasted sludge and specific locations of disposal areas shall be discussed.
5. **Operation, Maintenance and Compliance:** Describe any major operation and maintenance problems. If applicable, identify the location, frequency and cause of bypasses, overflows, unpermitted discharges, and KPDES permit violations. Also provide brief description of state and/or federal agreed orders against the regional planning agency.

Section 7: Forecasts of Flows and Waste Loads in the Planning Area

***This section shall be prepared by a professional engineer licensed in Kentucky.**

Requirements: Estimate the projected volumes of wastewater generated in the planning area over the proposed planning period and the basis of those estimates. This section shall include:

1. Current and projected residential flows for the proposed planning period.
2. Current and projected commercial and industrial flows for the proposed planning period.
3. The wastewater treatment plant proposed design capacity to properly treat the flows anticipated over the proposed planning period.
4. A copy of the waste load allocation (WLA) issued by the Division of Water.

Recommendations: Factors such as current flow volumes and pollutant loadings, preliminary determination of discharge limits, preliminary waste load allocation, available sites for construction of wastewater treatment plant, and available funding should be taken into consideration to discuss the merits of the design phase.

- **Demographic and Economic Projections:** Projections of economic and population growth, in conjunction with the land use planning, should be used for estimating future waste loads and flows. Projections should be based on an analysis of current growth trends and an estimate of future residential, commercial, and industrial growth. The Kentucky State Data Center, regional planning agencies, federal and state census authority studies, or planning documents should be used as sources of demographic information for communities within the planning area. Reasons for any inconsistencies should be documented.
- **Land Use:** The regional facility plan should be carefully coordinated with state, local, and regional land-use management regulations, and plans. Projected land-use patterns and densities should be used as a basis for determining the optimum capacity, type, and location of facilities. Where land use plans have not been prepared for all or part of the planning area, an estimate of future land use patterns and densities should be prepared in consultation with existing planning agencies, zoning commissions, and elected officials.
- **Planning Period:** The planning period is the time-span over which wastewater management needs are forecasted, facilities are planned to meet such needs, and costs are amortized. The facility planning period should extend beyond the date when the planned facilities are scheduled to begin operation. Since phased construction of facilities will often be a cost-

effective approach to meet changing conditions over the planning period, consideration should be given to defining initial flows and incremental flows projected for only a part of the planning period.

- **Forecasts of Waste Loads and Flows:** It is extremely important to accurately define wastewater flows since this information is critical in developing and assessing wastewater alternatives. The development of these flows shall also consider inflow and infiltration and combined sewer overflows. It is preferable to use available water supply or wastewater flow records when projecting future flows. In lieu of existing water usage records or recorded flows, then resources such as *Wastewater Engineering Treatment and Reuse* (Metcalf and Eddy; 1972 or future editions) and *Recommended Standards for Wastewater Facilities* (commonly referred to as 2004 Ten State Standards) should be consulted for developing potential future flows. All non-residential land usage with the potential for commercial or industrial development must be taken into account.

A breakdown of flows that identifies domestic, industrial, institutional, commercial, I/I, and septage flows for existing, initial year (initial flows projected at startup of recommended facilities), and design years should be presented. A flow table should be shown. In many instances, it is also advisable to further breakdown flows geographically in the planning area, since decentralized alternatives may be appropriate when estimating wastewater flows and loads. The following factors should be considered:

- Projections of economic and population growth- Estimates must be made for future residential, commercial, institutional, and industrial flows. To the extent possible, estimates should be based on existing records of wastewater flows or on reliable water supply records adjusted for consumption and other losses. This analysis should result in estimates of per capita flow for residential contributions and legitimate flow estimates for commercial, institutional, and industrial flows. If no wastewater or water use records exist, the rationale for estimation of future flows should be documented.
- An estimate of non-excessive infiltration/inflow- For an existing system an infiltration allowance of less than 275 gallons per capita per day of sewage flow based on the maximum flow received during a twenty-four (24) hour period exclusive of industrial flow; or less than 120 gallons per capita per day of sewage flow based on the annual average of daily flows exclusive of industrial flow should be used for estimating initial I/I flows from sewer lines.

- An analysis of pollutant loads from residential, commercial, and industrial sources in the existing sewer system.
- A projection of benefits possible from water conservation programs or other selected measures to reduce flow and wastes.

Section 8: Evaluation of Alternatives

***This section shall be prepared by a professional engineer licensed in Kentucky.**

Requirements: This section shall include an evaluation of alternatives in order to determine the appropriate facilities to meet the wastewater needs of the planning area and provide benefits that are cost-effective and environmentally sound. This section shall include the following information:

1. Alternatives :The regional planning agency shall conduct a detailed evaluation of the following alternatives:
 - a. The No-action alternative
 - b. Optimization of existing facilities
 - c. Regionalization, and
 - d. Any other alternative the regional planning agency wants to consider.

The level of detail in your analysis depends upon the size and scope of the project. In the facility plan discuss the reasons for the selection of a preferred alternative and the reasons for the elimination of other alternatives.

2. Detailed cost analysis including twenty (20) year present worth analysis for each alternative shall be conducted.
3. Alternatives shall be evaluated on nonmonetary effectiveness criteria, which is limited to implementability, environmental impact, engineering evaluation, public support, and regionalization.
4. Recommended alternative.

Recommendations:

- **Optimization of Existing Facilities:** The alternative for optimizing performance of existing facilities should be considered first. The level of treatment attainable with optimum performance of the existing facilities should serve as a baseline for planning additions or modifications to the existing wastewater facilities, flow/waste reduction and water conservation. For communities with centralized facilities, this alternative includes optimization of operation and maintenance of the wastewater collection, treatment, and disposal facilities. For communities where on-site systems are used for wastewater treatment and disposal, this alternative includes optimizing septage management plans, and

the continuing maintenance, repair, and upgrade of on-site systems in the planning area. Discuss the potential environmental and socio-economic benefits of this alternative.

- **Regionalization:** The possibility of implementing a regional solution to meet the wastewater needs of the planning area should be explored early in the planning process. Regional solutions may include interconnection of facilities, construction of one or more large facilities to eliminate the need for many small facilities, or joint management of facilities to improve operation and maintenance and reduce costs. Joint facilities may involve interceptors, treatment plants, septage facilities, or sludge and effluent disposal systems. **If a regional solution is selected for dealing with the water pollution problems, then detailed analysis of the other alternatives is not necessary.** Any detailed analysis of regional alternatives should include a map of wastewater collection and treatment system configurations and show the boundaries of political jurisdictions and service areas for each facility. The analysis of regional solutions should address the following special considerations:
 - Effects of interceptor locations on land use within and between urban areas, particularly where land is undeveloped.
 - Possible limitation on future expansion of wastewater facilities due to unavailability of land.
 - Discussion of the operational efficiencies expected from implementing the regionalization alternative.
 - Environmental and economic costs of delays likely to be associated with efforts to achieve a regional solution.
 - Describe the legal agreements necessary for implementing the regional solution.
- **Treatment Alternatives:** A range of treatment alternatives for each planning area should be considered. The plan should consider, where applicable, the following alternatives:
 - **No Discharge Treatment Technologies-** include slow-rate overland flow, slow-rate subsurface infiltration, and rapid infiltration methods.
 - **Conventional Treatment Technologies-** include those that employ proven and reliable technologies. Examples are: complete mix, sequencing batch reactor (SBR), contact stabilization, extended aeration, oxidation ditch, moving bed biological reactor (MBBR),

and pond technologies. The engineer should discuss how each proposed technology enables the regional planning agency to meet the waste load allocations issued by the Division of Water and should also demonstrate how the proposed design meets the reliability requirements of 401 KAR 5:005, section 13. The design engineer should to the extent possible build some flexibility into the design so it can be easily and economically refurbished in the future to meet tighter discharge permit limits, including nutrient controls.

- Advanced Treatment Technologies- if the treatment facilities are required to meet stringent water quality limits, then the regional planning agency may need to install advanced treatment technologies in order to meet those stringent limits consistently. Example technologies are: tertiary filtration with sand, cloth, and mixed media filters, chemical precipitation, and enhanced biological reactors systems.
- The use of decentralized facilities for treatment and disposal of wastewater, including the potential for utilizing on-site systems, package plants, cluster systems, or other systems may preclude the need for centralized facilities. Conventional on-site systems as well as recirculating sand filters, peat systems, attached-growth systems, and other innovative, alternative systems have been shown to provide efficient wastewater treatment and disposal when installed in appropriate locations. The site suitability, pollutant removal efficiency, groundwater and surface water impacts, and operation and maintenance requirements of these systems should be evaluated along with the other feasible alternatives.
- Wastewater treatment and disposal of effluent and residuals, including reuse, recycling, land application and contractual services for processing and disposal. Wherever feasible, beneficial reuse of wastewater residuals as achieved in land application alternatives is encouraged.
- Flow and waste reduction, including water conservation- Some types of flow and waste reduction measures include: measures for reducing sewer system infiltration/inflow; water conservation measures; industrial reuse, recycling and pretreatment programs; continuation of the use of on-site (private) facilities, such as conventional septic systems or alternative systems.

- Seasonal or controlled discharge options- The potential of retaining generated wastewaters for controlled release under optimal conditions, i.e. during periods when the receiving water has greater assimilative capacity.
- Collection Alternatives: A range of collection alternatives for each planning area should be considered. The plan should consider, where applicable, alternatives for:
 - Configuration of sewers and interceptors for wastewater collection, including considerations for alternative sewer systems such as pressure, small diameter, vacuum and Septic Tank Effluent Pumping (STEP) systems- Alternative arrangements of interceptors and trunk lines should be compared to determine the most cost-effective configuration. Sewers in developing areas should be planned on the basis of anticipated changes in land use and density. Analysis should be made, whenever possible, of the residential, commercial and industrial land use changes that a centralized project will induce. The sizes of interceptors should be based on projected flows and a cost effectiveness analysis of alternative pipe sizes. Preliminary routing should be done on a map that delineates the areas most likely to require sewers over the life of the plan.
- Screening of Alternatives: The realm of alternatives initially evaluated should include a broad range of wastewater alternatives that have the potential to meet the foreseeable wastewater needs for the planning area. Alternatives should be rejected if they fail to meet physical constraints of the planning area, such as climate, soils or topography, or if they are incompatible with water quality plans. A screening process should be employed to determine those alternatives that appear to provide the greatest environmental and cost benefit. This preliminary screening process will be guided by the wastewater needs specific to the planning area and a preliminary assessment of the major environmental, financial, technical, and institutional considerations of each alternative. Alternatives for treatment and discharge should take into account and allow to the extent practicable for the application of technologies at a later date to remove nutrients, including nitrogen and phosphorus. Following initial screening of the wastewater alternatives, a limited number of the most feasible alternatives should be evaluated in detail.
- Comparison and Ranking of Alternatives: Plan selection will involve making choices among alternatives based on a comparison of the significant costs, environmental impacts and benefits of each. While costs of alternatives may be directly compared, the comparison of environmental, institutional, and social impacts of each alternative may not be as straightforward. Sound judgment on the overall impacts of the alternatives will be critical in

selecting the plan with the greatest overall benefit. The impacts should be considered, wherever possible, in quantitative terms, and be based on the supporting analysis elsewhere in the plan. Where quantification is not possible, the comparison should be made by brief narrative description. The alternatives may be ranked after they are presented to aid final selection of a plan. Public meetings should be held at this critical stage of the planning effort so that the alternatives reflect the interests of the community and sufficient support is engendered for the regional facility planning process. The following are recommendation for ranking the alternatives:

- Monetary costs- The costs of each alternative along with a 20-year present worth cost analysis. Sufficient details shall be provided to allow for conducting a thorough cost analysis.
- User rates- Current and projected user rates resulting from implementation of the recommended alternative.
- Environmental impacts- Alternatives should be evaluated and screened for their environmental impacts. All significant impacts should be weighed to derive a value judgment as to the net overall effect of each alternative relative to other plans. Significant adverse impacts could be a basis for rejecting an option and, thus, reduce the number of viable alternatives. Other impacts that may require further study or professional surveys should be identified, to the extent possible, early in the planning process.
- Implementation capability- The ability of the regional planning agency to implement the recommended alternative should be weighed carefully. If there are financial, legal, or administrative barriers that would prevent the complete and timely implementation of the regional facility plan, then those barriers should be addressed in the plan before it is adopted. If implementation of the plan requires the passage of ordinances, or the development of inter-local agreements, these articles should be developed as part of the planning process.
- Other considerations- The contribution to water quality objectives, flexibility and public acceptability should also be evaluated in selecting the alternative that provides the greatest overall benefit.

- Design Considerations:
 - Location of Facilities- To the extent possible, evaluation of sites for treatment plants, interceptors, transmission lines, outfalls, pumping stations, and other major works should take into account the following factors: (a) minimize odors and locate facilities away from residential areas; (b) minimize aesthetic problems through proper design and landscaping at facility sites; (c) locate treatment plants, outfalls, and other facilities where they will not affect any sensitive use areas; and (d) proximity to 25 and 100 year flood levels and impacts on floodplains and floodways. Where alternative sites are unavailable, special precautions must be taken. Recommended Standards for Wastewater Facilities (also known-Ten States Standards) Section 11.28 c. contains additional site evaluation criteria that may need to be considered.
 - Process unit sizing basis shall be provided- 401 KAR 5:005 establishes minimum requirements for commonly used technologies. Ten States Standards is incorporated by reference to this regulation and should be consulted for design requirements. A process flow diagram shall be included. Complete Unit Process Design Criteria and Design Flows and Concentrations forms included in Section 12.
 - Proposed treatment technologies not included in 401 KAR 5:005 or Ten States Standards will be required to demonstrate reliable and effective treatment (see Ten States Standards Section 53.2) and will be approved by the Cabinet on a case by case basis.
 - Phased Construction- Adding capacity in phases during a planning period may be more cost-effective in some cases than providing sufficient capacity in initial construction for the entire planning period. A present worth cost analysis of phased development should be included in the regional facility plan. Factors to be considered are: (a) relative cost of providing excess capacity initially compared with the cost of providing capacity when needed; (b) uncertainties of projected long-term wastewater flows, and possible technological advances or flow and waste reduction measures that may limit need for excess capacity. Modular development of operable components of wastewater facilities is advisable in areas where high growth rates are projected, or where existing facilities are to be used initially but phased out later; (c) Flexibility- Regional facility planning should assess wastewater alternatives in providing sufficient land to allow for expansion of the wastewater facilities to handle unforeseen increases in wastewater flows, pollutant loads, and/or more stringent treatment requirements.

- **Evaluation of Cost:** A cost effectiveness analysis should be performed on all alternatives advanced for detailed evaluation. This analysis should be done in accordance with accepted engineering economic principles and include a calculation of the direct monetary costs of each alternative using present worth or equivalent uniform annual cost as a basis. The analysis should include consideration of all project costs over a 20-year period.
 - **20-year Present Worth-** A present worth may be thought of as the sum that, if invested now at a given interest rate, would provide exactly the funds required to make all necessary expenditures during the life of the project. The same cost analysis method must be utilized for all wastewater alternatives being considered.
 - **20-year Equivalent Uniform Annual Cost (EUAC) –** A EUAC is the expression of non-uniform series of expenditures as a uniform annual amount. This method will allow the regional planning agency to compare annualized costs for each alternative, which in some instances may be preferable for presentation to the stakeholder groups.
- **Cost Effectiveness Analysis:** The cost effective analysis of each alternative should be developed and should include all costs associated with construction of and operation of wastewater facilities and other appropriate monetary factors including:
 - **Capital Costs-** Costs of construction of wastewater facilities (including biosolids/ sludge and septage management) and any costs associated with lease, easement, or acquisition of rights-of-way.
 - **Operation and Maintenance (O&M) Costs-** These costs should include costs for labor, utilities, materials, contractual services, expenses, and replacement of equipment and parts to ensure effective and dependable operation during the planning period. The O & M costs should be adjusted to also reflect any revenues received from the sale or distribution of wastewater facility by-products (methane gas, sludge products, etc.).

Salvage Value- The salvage value of any wastewater facilities at the end of 20-years should also be considered in the cost effectiveness analysis. This value is normally based on straight line depreciation from the initial cost at the time of analysis to the end of the asset useful life. The economic analysis should also reference anticipated staged capital costs and anticipated equipment costs within the 20 year evaluation period.

Section 9: Cross-Cutter Correspondence and Mitigation

Requirements: This section shall include copies of letters sent to the following cross-cutting agencies and their corresponding responses:

1. U.S. Fish and Wildlife Service
2. Kentucky Department of Fish and Wildlife Resources
3. Kentucky Heritage Council
4. US. Army Corps of Engineers
5. Natural Resources and Conservation Service

These letters must contain a detailed description of the proposed project(s) supported by location maps and/or photographs to each applicable cross-cutting agency. The Cabinet cannot approve a regional facility plan prior to receiving letters from the cross-cutting agencies documenting “no-impact” from the proposed project, or stating that their concerns have been adequately addressed. If the cross-cutting agency finds a resource will be adversely impacted as a result of a proposed action, the cross-cutting agency will direct the regional planning agency to implement specific measures to avoid, minimize or compensate for the adverse impact. The regional facility plan must also describe any measures intended to minimize or mitigate adverse impacts that may be affected by the proposed project.

Recommendations: Early pre-development consultations with the cross-cutting agencies will serve to identify potential adverse impacts from the proposed project. These consultations may allow the project to be redesigned to avoid, minimize or compensate for potential adverse effects to social, historical or environmental resources and also avoid unnecessary project delays. Mitigation measures may include, but are not limited to: changes in design, size, or location of facilities; rerouting of facilities to avoid sensitive areas; phased construction of facilities; best management practices; or other measures intended to eliminate or lessen potential adverse impacts.

Section 10: Evaluation of Recommended Regional Facility Plan

Requirements: This section of the regional facility plan shall summarize the critical components of the recommended plan including environmental impacts, institutional structure, funding plan and implementation schedule.

1. **Environmental Impacts:** The environmental impacts of the recommended plan shall be discussed. This shall include a discussion of impacts on surface and groundwater quality, water supply, air quality, wetlands, floodplains, endangered species, historical and archaeological sites, important prime farmland, and any other applicable environmentally sensitive areas. Any measures intended to mitigate adverse impacts shall also be described.
2. **Institutional Structure:** Any institutional requirements for implementing the recommended plan shall also be presented. Such considerations shall include inter-municipal agreements, establishment of sanitation districts, or the need for any specific rules or ordinances.
3. **Funding Plan:** The funding plan necessary for implementation of the recommended plan shall be presented. This shall include proposed total project(s) cost and a list of the amount, sources and status of all funding sources (e.g., federal, state, or locals funds). Provide the current and projected residential user charge rate based on 4,000 gallons per month of water usage. Projected user rates shall be based on the recommended plan. Also provide a copy of the regional planning agency's current user rate schedule.
4. **Implementation Schedule:** Present a schedule for implementation of the recommended plan, which includes a general schedule for the design and construction of wastewater facilities and any plan to phase construction of facilities.

Section 11: Documentation of Public Participation

Requirements: This section shall include;

1. A copy of the newspaper advertisement
2. Measures taken to solicit public participation
3. A summary report presented to the public during the public meeting
4. Public meeting attendance sheet
5. Public Comments

Recommendations: As indicated throughout this guidance document, the public should participate from the beginning in regional facility planning so that interests and potential conflicts may be identified early and considered. The importance of building a consensus among citizens and stakeholders is extremely critical, as the fate of many planning efforts is decided by the willingness of the public to accept the plan and take action to appropriate the necessary funds for design and construction of facilities. Therefore, it is recommended to hold one public meeting to discuss the draft alternatives and environmental impacts prior to the required public meeting.

The regional planning agency should define issues and analyze information so that the public will clearly understand the costs and benefits of alternatives considered during the planning process. Efforts should be made to ensure that the interests of a broad spectrum of the public are represented in the planning process. Projects that are complex or controversial may require a more substantial public outreach. The public can be informed and their input solicited through a variety of means, including the following: Advisory groups, depositions, information contacts, liaison with citizen groups, mailings, news media, polls, public meetings, speeches, surveys, task forces, correspondence, exhibitions, workshops, interviews, newsletters, seminars.

Section 12: Regional Facility Plan Completeness Checklist and Forms

Requirements: Two (2) hard copies, one certified by a professional engineer licensed in Kentucky and one (1) non-certified digital copy of the regional facility plan and the planning area shapefile on a Compact Disc (CD) shall be submitted to the Cabinet. This completeness checklist should be completed and submitted with each regional facility plan.

Regional Planning Agency Name: _____

Date: _____

		<u>PAGE #</u>
SECTION 1		
REGIONAL FACILITY PLAN SUMMARY- This section shall provide a brief summary of the information provided in the facility plan, including the following:		
1.	Purpose of the plan and major problems evaluated in the plan.	
2.	Recommended alternative chosen to remediate or correct the problems and/or serve the area of need identified in the plan. Also, include any institutional arrangements necessary to implement the recommended alternative(s).	
3.	Estimated cost of implementing the proposed plan (including user fees) and the proposed funding method to be used.	
4.	Planning agency commitments necessary to implement the plan.	
5.	Schedule of implementation for projects.	
SECTION 2		
STATEMENT OF PURPOSE AND NEED- This section shall contain a brief description of the purpose and need for a submitting the facility plan.		
SECTION 3		
PHYSICAL CHARACTERISTICS OF THE PLANNING AREA- This section shall delineate the planning area boundaries and describe key topographic, geographic and pertinent natural or man-made features of the area. Digital or electronic submission of the planning area boundary shapefile in a standard GIS format shall also be included. This section shall also include the following maps:		
1.	One (1) up-to-date map, suitable for photocopying, indicate the planning area boundary, service area boundary, watershed boundaries, county lines, populated places, cities and/or towns and project areas or proposed planning period phases.	
2.	One (1) up-to-date map, suitable for photocopying, include locations of wastewater treatment facilities (including package treatment plants), discharge location(s), collection lines (gravity, force main, interceptors), pump stations, public drinking water intake points and groundwater supply areas [Source Water Area Protection Plans (SWAPP) and/or Wellhead Protection Areas (WHPA)].	
3.	One (1) seven and one-half (7 ½) minute USGS topographic map including the location of wetlands, delineation of the 100-year floodplain, surface water(s), and topography.	

4.	If available, a local planning and zoning land use map.	
SECTION 4		
SOCIOECONOMIC CHARACTERISTICS OF THE PLANNING AREA- The following characteristics of the planning area shall be discussed:		
1.	Historical, current, and projected population in the planning area including wastewater contributions from industrial and commercial sources.	
2.	Current and projected population in the existing service area and unsewered parts of the planning area	
3.	Economic or social benefit to the affected community	
SECTION 5		
EXISTING ENVIRONMENT IN THE PLANNING AREA- Describe existing physical, biological, cultural, and other resource features within the planning area with an emphasis on those that may be impacted by the proposed plan or projects, including the following:		
1.	Physical features such as surface and groundwater quality, water sources and supply, wetlands, lakes, streams, air pollution, floodplains, soils, geology, and topography	
2.	Biological: Identify plant and animal communities in the planning area with an emphasis upon endangered and threatened species likely to be impacted	
3.	Cultural: Describe archaeological and historical resources that may be affected by the proposed project	
4.	Other Resource Features such as national and state parks, recreational areas, USDA Designated Important Farmland, and any other applicable environmentally sensitive areas	
SECTION 6		
EXISTING WASTEWATER SYSTEM- This section shall be prepared by a Professional Engineer licensed in Kentucky. A description of the existing facilities within the planning area shall include the following:		
1.	On-site systems in the planning area	
2.	Physical condition of the existing wastewater treatment plant(s) including the type, age, design capacity, process units, peak and average wastewater flows, current discharge permit limits, schematic layout of treatment plant. Include a narrative description of the capacity of the treatment plant to meet reliability and redundancy requirements as outlined in regulation 401 KAR 5:005, Section 13.	
3.	Existing collection and conveyance system and its condition	
4.	Existing biosolids disposal method	
5.	Existing operation, maintenance and compliance issues	
SECTION 7		
FORECASTS OF FLOWS AND WASTE LOADS IN THE PLANNING AREA- This section shall be prepared by a professional engineer licensed in Kentucky and shall include:		
1.	Current and projected commercial, industrial and residential growth for the proposed planning period	
2.	A copy of the waste load allocation (WLA) issued by the DOW for new or expanded treatment plant projects	

SECTION 8		
EVALUATION OF ALTERNATIVES- This section shall be prepared by a professional engineer licensed in Kentucky and include an assessment of alternatives to determine the appropriate facilities that will meet the wastewater needs of the planning area and provide benefits that are cost-effective and environmentally sound. The section shall include:		
1.	No-action alternative	
2.	Optimization of existing facilities	
3.	Regionalization	
4.	Other alternatives	
5.	Detailed cost analysis along with 20 year present worth analysis for each alternative	
6.	Recommended alternative	
SECTION 9		
CROSS-CUTTER CORRESPONDENCE AND MITIGATION- Each facility plan shall include cross-cutter correspondences to and from each agency related to the following four environmental and cultural concerns:		
1.	Threatened and Endangered Species: The U.S. Fish and Wildlife Service- Kentucky Ecological Services Field Station and the Kentucky Department of Fish and Wildlife Resources	
2.	Historical Resources: The Kentucky Heritage Council State Historic Preservation Office	
3.	Aquatic Resources: The US. Army Corps of Engineers (Louisville, Nashville, or Huntington Districts).	
4.	Agricultural Resources: The local office of the Natural Resources Conservation Service (NRCS) or USDA Service Center	
SECTION 10		
EVALUATION OF RECOMMENDED REGIONAL FACILITY PLAN- This section of the facility plan shall summarize the critical components of the recommended plan.		
1.	Environmental impacts	
2.	Institutional structure	
3.	Funding plan	
4.	Current and projected residential user charge rate based on 4,000 gallon usage per month	
5.	Implementation schedule	
SECTION 11		
DOCUMENTATION OF PUBLIC PARTICIPATION- The section shall include a copy of the newspaper advertisement/proof of publication, attendance sheet, and public comments.		

Unit Process Design Criteria Form

Unit Process	Number of Units ¹	Flow per Unit (MGD)	Design Criteria ²
Influent Pumping			
Screening			
Grit Removal			
Primary Clarification			
Biological Process			
Chemical Phosphorus Removal			
Final Clarification			
Disinfection			
RAS/WAS Pumping			
Sludge Treatment			
Sludge Dewatering			

1*The number of units shall be in accordance with the reliability/redundancy checklist

2*The design criteria shall be in accordance with 401 KAR 5:005 including Ten States Standards

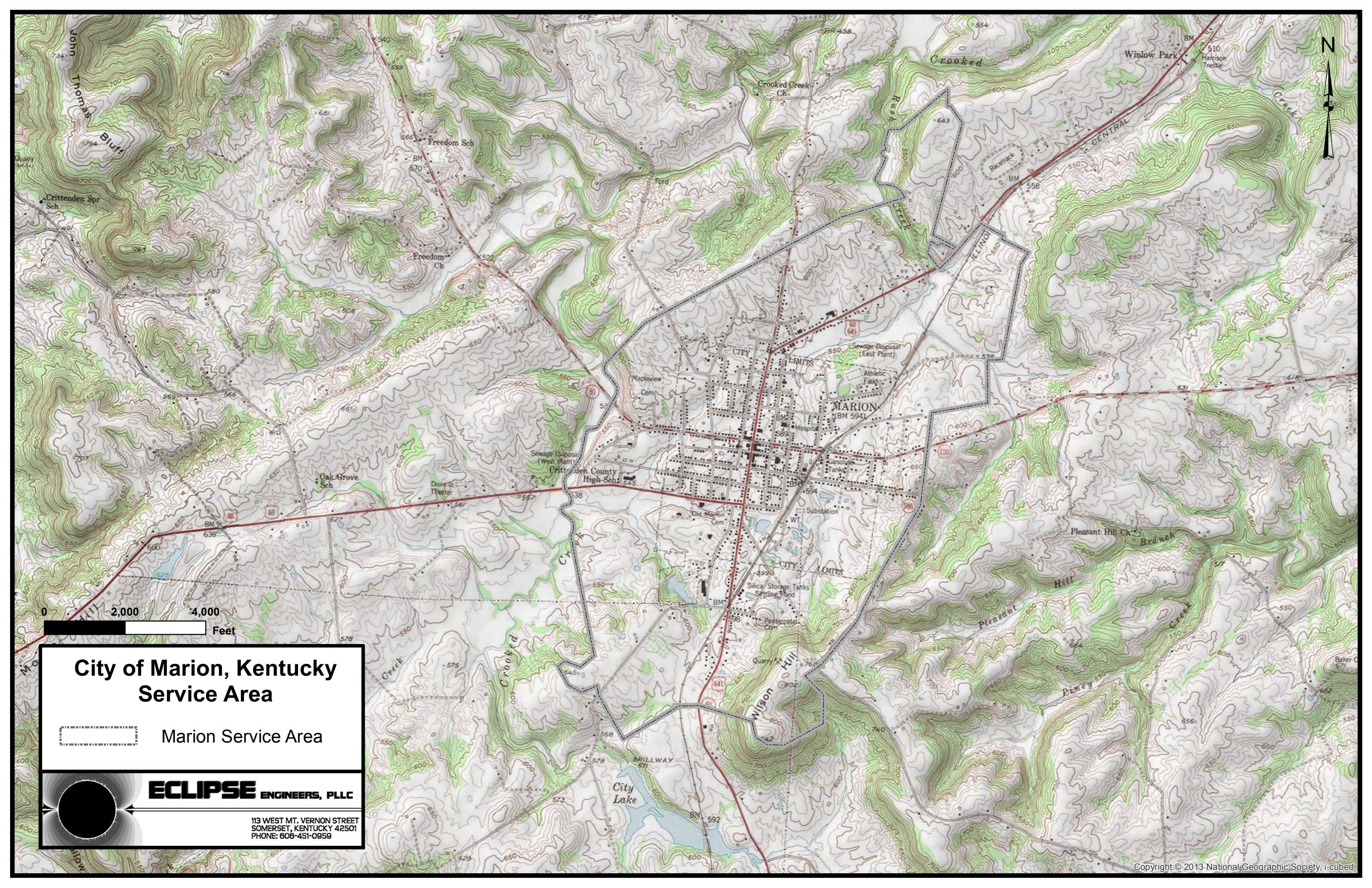
Note: This is a suggested format only. The process listed here will not fit every project and will therefore need to be revised accordingly.

Design Flow and Concentration Form

Design Flows and Organic Concentrations	Flows	BOD ₅	BOD ₅	SS	SS	NH ₃ -N	NH ₃ -N	TKN	TKN	P	P
	MGD	mg/l	lb/day	mg/l	lb/day	mg/l	lb/day	mg/l	lb/day	mg/l	lb/day
Average Daily											
Domestic Portion											
Industrial Portion											
Total											
Population Equivalent											
Peak Hourly											
Domestic Portion											
Industrial Portion											
Total											
Peak Daily											
Peak Instantaneous											

Appendix S

Planning Area Map, 1" = 2,000'



**City of Marion, Kentucky
Service Area**

 Marion Service Area

**ECLIPSE** ENGINEERS, PLLC

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SOMERSET, KENTUCKY 42501
PHONE: 606-451-0959